

What is claimed is:

1 1. A method for compressing a distributed integrated circuit model
2 comprising the steps of:

3 selecting at least a first net from a plurality of nets contained in
4 the distributed integrated circuit model; and

5 compressing at least a second net connected to said first net by
6 removing all resistors from said at least a second net, and assigning said at least
7 a second net a total capacitance representing a sum of all capacitors on said at
8 least a second net.

1 2. A method for compressing a distributed integrated circuit model
2 as defined by claim 1 wherein said at least a second net is isolated from said
3 first net by a transistor.

1 3. A method for compressing a distributed integrated circuit model
2 as defined by claim 1 wherein said first net and said second net are contained
3 within a single netlist.

1 4. A method for compressing a distributed integrated circuit model
2 as defined by claim 1 wherein:

3 said at least a first net comprises a plurality of first nets defining a
4 power grid, and said at least a second net comprises a plurality of secondary
5 nets each being connected to said power grid and isolated from said power grid
6 by a transistor.

1 5. A method for compressing a distributed integrated circuit model
2 as defined by claim 1 further comprising the steps of:

3 compressing said at least a first net by removing all resistors from
4 said net and summing all capacitors from said net.

5 6. A method for compressing a distributed integrated circuit model
6 as defined by claim 5 wherein said at least a second net comprises a plurality of
7 second nets all connected to said first net and downstream of said first net

1 7. A method for compressing a distributed integrated circuit model
2 as defined by claim 6 wherein said plurality of second nets comprise all nets
3 connected downstream of said first net and upstream of an inverter.

1 8. A method for performing an electromigration analysis on a
2 distributed integrated circuit comprising the steps of:

3 selecting a group of first nets defining a power grid from a netlist,
4 said netlist comprising a distributed RC model;

5 compressing a plurality of secondary nets connected to said
6 power grid and isolated from said first net by a transistor by removing resistors
7 from said secondary nets and assigning to each of said secondary nets a total
8 capacitance value equal to the sum of capacitance of all the capacitors on
9 respective of said secondary nets; and

10 performing an electromigration analysis on said power grid using
11 said first nets and said compressed secondary nets.

1 9. A method for performing a gross current estimation on a
2 distributed integrated circuit comprising the steps of:

3 selecting a first net to perform the gross current estimation on,
4 said first net having a distributed model;

5 compressing said first net by removing all resistors from said first
6 net and summing all capacitors on said first net;

7 compressing at least a secondary net connected to said first net
8 and downstream of said first net by removing all resistors from said at least a
9 secondary net and summing all capacitors on said at least a secondary net; and

10 calculating a gross current estimation for said first net using said
11 compressed at least a secondary net.

1 10. A method for performing a gross current estimation on a
2 distributed integrated circuit as defined by claim 9, wherein said at least a
3 secondary net comprises a plurality of secondary nets connecting said first net
4 with a downstream inverter through which substantially no current flows.

1 11. A method for performing a gross current estimation on a
2 distributed integrated circuit as defined by claim 10 wherein said inverter is
3 selected from the group consisting of a gate terminal of a transistor or a
4 transistor in an off condition.

1 12. A method for performing a gross current estimation on a
2 distributed integrated circuit as defined by claim 9, wherein said first net has a
3 current limitation, wherein said distributed model of said first net has a
4 plurality of individual segments, and wherein the method further comprises the
5 steps of:

6 determining whether said calculated gross current estimation for
7 said first net exceeds the current limitations for said first net; and

8 un-compressing said first net if said calculated gross current
9 estimation exceeds the current limitations for said first net by returning said
10 compressed first net to a distributed model and performing a gross current
11 estimation on said individual segments of said distributed model using said
12 compressed at least a secondary net.

1 13. A method for performing a gross current estimation on a
2 distributed integrated circuit as defined by claim 12 further comprising the step
3 of:

4 selecting one of said compressed at least a secondary net to
5 perform a gross current estimation on if said calculated gross current estimation
6 for said first net does not exceed said first net current limitation; and

7 calculating a gross current estimation on said selected one of said
8 compressed at least a secondary nets using said selected compressed one of
9 said at least a secondary nets and remaining of said compressed at least a
10 secondary nets.

1 14. A computer program product for compressing a distributed
2 integrated circuit model, the program product comprising computer executable
3 instructions embedded in a computer readable medium that when executed
4 cause a computer to:

5 select at least a first net from a plurality of nets contained in the
6 distributed model integrated circuit model; and

7 compress at least a secondary connected to said first net by
8 removing all resistors said at least a secondary net and summing all capacitors
9 on said at least a secondary net.

1 15. A computer program product for compressing a distributed
2 integrated circuit model as defined by claim 14 wherein said at least a first net
3 comprises a plurality of nets defining a power grid, and said at least a
4 secondary net comprises a plurality of secondary nets connected to said power
5 grid, each of said secondary nets isolated from said power grid by at least a
6 transistor.

1 16. A computer program product for compressing a distributed
2 integrated circuit model as defined by claim 14 wherein said program
3 instructions when executed further cause the computer to compress said at least
4 a first net by removing all resistors from said first net and summing all
5 capacitors on said first net, and wherein said at least a secondary net comprises
6 a plurality of secondary nets connecting said first net with an inverter through
7 which substantially no current flows.

1 17. A computer program product for performing an electromigration
2 analysis on an integrated circuit power grid, the program product comprising
3 computer readable instructions embedded in a computer readable medium that
4 when executed cause a computer to:

5 compress a plurality of secondary nets connected to a plurality of
6 first nets that define the power grid, each of said secondary nets isolated from
7 said first nets by a transistor, wherein compressing comprises removing
8 resistors from said secondary nets and assigning to each of said secondary nets
9 a total capacitance value equal to the sum of capacitance of all the capacitors
10 on respective of said secondary nets; and

11 perform an electromigration analysis on the power grid using said
12 first nets and said compressed secondary nets.

1 18. A computer program product for performing a gross current
2 estimation on a distributed integrated circuit, the program product comprising
3 computer executable instructions embedded in a computer readable medium,
4 the instructions when executed causing the computer to:

5 select a first net to perform the gross current estimation on, said
6 first net having a distributed model, compress said first net by removing all
7 resistors from said first net and summing all capacitors on said first net;

8 compressing at least a secondary net by removing all resistors
9 from said at least a secondary net and summing all capacitors on said at least a
10 secondary net, said at least a secondary net being connected to said first net
11 downstream of said first net and upstream of an inverter through which
12 substantially no current flows; and

13 calculating a gross current estimation for said first net using said
14 compressed at least a secondary net.

1 19. A computer program product for performing a gross current
2 estimation on a distributed integrated circuit as defined by claim 18, wherein
3 said first net has a current limitation, wherein said distributed model of said

4 first net has a plurality of individual segments, and wherein the computer
5 readable instructions when executed further cause the computer to:

6 determine whether said calculated gross current estimation for
7 said first net exceeds the current limitations for said first net;

8 un-compress said first net if said calculated gross current
9 estimation exceeds the current limitations for said first net by returning said
10 compressed first net to said first net distributed model and performing a gross
11 current estimation on individual segments of said first net distributed model
12 individual segments using said compressed at least a secondary net; and

13 select one of said compressed at least a secondary nets to perform
14 a gross current estimation on if said calculated gross current estimate for said
15 first net does not exceed said first net current limitation; and

16 calculate a gross current estimation on said selected one of said
17 compressed at least a secondary nets using said selected compressed one of
18 said at least a secondary nets and remaining of said compressed at least a
19 secondary nets.

1 20. A computer program product as defined by claim 18 wherein said
2 at least a secondary net comprises a plurality of secondary nets, said plurality
3 of secondary nets connecting said first net with said inverter.